AB290A PCI-X
2-Port U320 SCSI and 2-Port Gigabit Ethernet
Combination Card Installation Guide

**For mpt Driver Versions B.11.11.02 and B.11.23.01 and
For iether Driver Versions B.11.11.07 and B.11.23.05**

HP 9000 and HP Integrity Systems

hp ®

i n v e n t

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Hardware and Software Installation Procedure

These instructions apply to AB290A PCI-X 2-Port U320 SCSI and 2-Port Gigabit Ethernet combination cards. For pre-requisite information such as system firmware requirements or card firmware requirements, please see the AB290A Combination Card Support Matrix on the web at **http://docs.hp.com** under "I/O Cards and Networking Software" and then under "Combination Cards."

If your combination card was factory installed (ordered on product option 0D1), the two software bundles required for this card --**IEther-00** (for LAN) and **scsiU320-00** (for SCSI) are already loaded onto your system's hard drive.[1]

Adding in the card: HP-UX 11i v 1.0

If your system is HP-UX 11i v 1.0 based, you need to get the two driver bundles from the December 2004 version of HP-UX 11i v 1.0. You do not necessarily have to load the entire OE if you don't want to. To add the product for 11i v 1.0:

- You can either load the entire HP-UX 11i v 1.0 December 2004 OE from the distribution media and you will automatically get the correct LAN and SCSI driver bundles.

  or

- You can just select and load the two driver bundles **IEther-00** and **scsiU320-00** required for this card.

Adding in the card: HP-UX 11i v 2.0 of September 2004 or later

- In order to use the AB290A combination cards with HP-UX 11i v 2.0 of September 2004, your system needs to be on that OE.

- So, if your system does not have 11i v 2.0 of September 2004 (or later), you need to load the entire HP-UX 11i v 2.0 September 2004 (or later) OE from the distribution media, and you will automatically get the correct LAN and SCSI driver bundles.

These AB290A combination cards can be added to your system or replaced without the need to shut down or reboot the system--a process called online addition and replacement (OLAR). The following instructions assume you are not performing online addition and replacement.

Step 1: Access the system card bay

- If the system is running, first, issue the `sync` command. Then, shut down the system by executing: `shutdown -h`. Respond "y" to the continue to shutdown prompt.

- Wait for the system to shut down completely, and then power off the system by pressing the system off button. Ensure that the system is grounded.

- Open the system to gain access to the PCI backplane.

- Select an empty PCI or PCI-X slot and remove the slot cover. The card can operate in PCI as well as PCI-X mode. Some servers have "shared" slots. If you put this card in a shared slot that is shared with a *slower* card, both cards will then operate at the slower card's speed.

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1. If your combination card was factory installed (ordered on product option 0D1), you do not need to perform the hardware and software installation steps,. You still need to configure the card's IP address and possibly set other parameters and options such as those mentioned in Table 2 on page 12 The Network Configuration worksheet.

Step 2: Install the card

- Check the latest support matrixes to see the systems that support this card, how many cards per system, and if any software updates are needed. There are support matrixes for both Gigabit Ethernet and SCSI available on the web at **http://docs.hp.com** under "I/O Cards and Networking Software."

- Observe the antistatic precautions. HP recommends wearing ESD straps when installing the card.

- Record the serial number and MAC address located on the card for future reference. The MAC address labelled on the card refers to LAN port A. Add 1 to obtain the MAC address for LAN port B.

- Grasp the card by its edges or faceplate with both hands, insert the card into the slot, and firmly but gently press the card in until it is fully seated.

- Secure the card and reassemble the system.

Step 3: Connect the card to the network

- Attach two LAN cables to the card (Figure 1). For 1000Base-T, cabling must be Cat 5 UTP or better with RJ-45 connectors. The maximum cable length for 1000Base-T (Copper UTP) is 100 meters over Cat 5 or Cat 5E.

- Attach the free end of a LAN cable to any unused port on the switch. Do the same for the other port. The LAN ports on the cards operate at 10 or 100 Mbit/s in either full- or half-duplex modes and at 1000 Mbit/s only in full-duplex mode. Set the ports on the card and on your switch according to the following table.

Table 1   HP-UX 1000Base-T Supported Configurations

HP-UX 1000Base-T Port	Link Partner	Resulting Speed
AUTO	AUTO	Highest Common Speed (HP-UX supports 10/100/1000)
AUTO	1000 FD fixed/manual	1000 Mbit/s FD
10 HD	10 HD (for example, a 10Base-T Hub)	10 Mbit/s HD
10 FD	10 FD	10 Mbit/s FD
100 HD	100 HD	100 Mbit/s HD
100 FD	100 FD	100 Mbit/s FD

If you are using Jumbo Ethernet frames, ensure that:

— all end stations on a given **LAN**[1] have the same maximum transmission unit (MTU) setting;

— intermediate stations such as switch ports in your LAN have an MTU equal to or greater than the end station's MTU.

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1. In the Jumbo Frames discussion, "LAN" means that the end stations do not have any routers or layer 3 switches in between them.

Step 4: Connect the SCSI peripherals

You can connect as many as 15 other SCSI devices to each port on this card by chaining them together serially with shielded external SCSI cables.

The maximum length of the SCSI bus is 12 meters when using LVD signalling and 6 meters when using SE.

- Plug the 68-pin very high density cable interconnect (VHDCI) connector on the shielded external cable into SCSI port A or B.

- Plug the 68-pin connector on the other end of the shielded external SCSI cable into the SCSI connector on your external SCSI device.

SCSI Bus Termination

The pieces of equipment on the ends of a SCSI bus normally have terminators. *Remove or disable termination on all other SCSI devices or initiators in the middle of the bus. This card's SCSI ports have automatic termination when shipped from the factory--no physical terminators are required on unused ports of the card.*

Please be aware of the following conditions:

— Connect only external SCSI devices to this SCSI card. Terminate the last external device on the SCSI bus, and disable the termination on all other devices. Termination on this SCSI card is automatically enabled in this case (if the jumper is off).

— Low-voltage differential peripheral devices are normally terminated with external terminators but are sometimes set with jumpers or a switch on the peripheral. Refer to the device manual to identify terminator settings and how to change them.

Step 5: Power Up the system

- Determine the SCSI ID required for each device on the SCSI bus.

- Power up the system.

- Record the IDs of the SCSI ports on this card.

Setting SCSI IDs Offline

For PA-RISC based systems, you can use the Boot Console Handler (BCH) menus to set SCSI IDs offline according to the instructions in the manual *HP A7173A PCI-X Dual Channel Ultra320 SCSI Host Bus Adapter Support Guide* available at `http://docs.hp.com`.

For Itanium™ based systems, use EFI to set the SCSI IDs offline. See the *HP A7173A PCI-X Dual Channel Ultra320 SCSI Host Bus Adapter Support Guide for details.*

Setting SCSI IDs Online

For all supported systems (HP Integrity or HP 9000), you can use the `mptconfig` command to display and set SCSI IDs online . See the *HP A7173A PCI-X Dual Channel Ultra320 SCSI Host Bus Adapter Support Guide* for details.

NOTE   Peripheral device SCSI IDs are typically determined automatically by the storage enclosure, or they may be set manually by a switch on the storage enclosure. Refer to the peripheral device documentation, to determine how the SCSI ID of each peripheral device is set, and how to change it.

IMPORTANT You must not have duplicate SCSI IDs on a SCSI bus; the system may hang or crash if you have duplicate SCSI IDs on the same bus.

Setting SCSI IDs

You must set each SCSI device and its corresponding port on the SCSI card to a separate SCSI ID, 0 through 15 for a 16-bit SCSI. SCSI ID 7 is the preset host adapter setting, giving it the highest priority on the SCSI bus.

To change this default to a different SCSI address for high availability (HA) systems, you must use the Boot Code Handler or BCH. You must invoke the appropriate commands in the SCSI section of the BCH and change the address electronically to whatever is required for the HA configuration being used.

Peripheral device SCSI IDs are usually set with jumpers or a switch on the peripheral. Refer to the peripheral manufacturer's instructions to determine the ID of each device and how to change it. You must have no duplication of SCSI IDs on a SCSI bus.

- Upon power up, any error messages will appear on the terminal display or system console. You can also use the `dmesg` command to retrieve startup messages later.

- Verify that the Ethernet LAN connector's Link LED is on.

- When the system is up, log in as `root` and verify that the card and its hardware path are displayed by executing the command: `ioscan`.

Step 6: Prepare to install the software

- Check that the `/usr/bin`, `/usr/sbin`, and `/sbin` directories are in your PATH using the command: `echo $PATH`

- Check the HP-UX version by entering: `uname -r`

  # **uname -r**
  B.11.11

   or

  B.11.23

  The version must be B.11.11 for 11i v 1.0 or B.11.23 for 11i v 2.0.

- Check the Release Notes for **IEther-00** and **scsiU320-00** to see if you need to install any appropriate patches for your system. Release Notes are available on the Web at http://docs.hp.com under I/O Cards and Networking Software.

Step 7: Install the latest software.

- Load the software media into the appropriate drive.

  — If you are adding the Gigabit Ethernet software bundle (**IEther-00**) for 11i v 1.0, you can get the Gigabit Ethernet software bundle on the December 2004 (or later) OE distribution media.

  — If you are adding the Gigabit Ethernet software bundle (**IEther-00**) for 11i v 2.0, you must use the September 2004 (or later) OE distribution media.

- Run the `swinstall` program to install the software using the command: **swinstall**.

- Change the host name after "Source Host Name," if necessary.

- Click the Source Depot Path to identify the registered depot for the appropriate source depot path and activate the OK button to return to the Software Selection Window.

- Highlight the 1000Base-T software **IEther-00** (for cards such as AB290A).

- Choose Mark for Install from the "Actions" menu to choose the product to be installed.

- Choose Install from the "Actions" menu to begin product installation and open the Install Analysis Window.

- Activate the OK button in the Install Analysis Window when the Status field displays a "Ready" message.

- Activate the YES button at the Confirmation Window to confirm that you want to install the software. `swinstall` loads the fileset, runs the control scripts for the filesets, and builds the kernel. This should take about 3 to 5 minutes. When the status field indicates Ready, click Done. A Note Window then opens. Click the OK button to reboot the system.

- If you are adding the SCSI driver (**scsiU320-00**) for 11i v 1.0, you can find the SCSI driver on the December 2004 (or later) OE distribution media. If you are adding the SCSI driver (**scsiU320-00**) for 11i v 2.0, you must use the September 2004 (or later) OE distribution media. Just repeat Step 7 to load it.

Step 8: Configure the card using SAM

- Log in as `root` and verify that the card and its hardware path are displayed by entering: **`ioscan`**.

- Run the System Administration Manager by entering: `sam`.

- Double-click Networking and Communications.

- Double-click Network Interface Cards.

- Highlight the AB290A combination SCSI/Gigabit Ethernet card and choose `Configure` from the "Actions" menu.

- Fill in the form according to the instructions using the "Network card Configuration Worksheet" in this document.

- Click the OK button to activate the card and then select `exit` from the "File" menu until you exit SAM.

Step 9: Verify the SCSI installation

After installing the scsiU320-00 software bundle containing the mpt driver, installing the AB290A adapter, and attaching the peripheral devices, verify that all of the components are working by following these steps:

- To verify that the mpt driver appears for each installed card, enter:

    `ioscan -fnkd mpt`

    The `ioscan` output will be similar to the following example:

```
# ioscan -fnkd mpt
Class I H/W Path Driver S/W State     H/W Type Description


=============================================
ext_bus 6 1/0/2/0/0  mpt  CLAIMED INTERFACE HP AB290A PCI-X 2port U320 SCSI/2port
1000Base-T Adapter
                      /dev/mpt6
ext_bus 7 1/0/2/0/1 mpt  CLAIMED INTERFACE HP AB290A PCI-X 2port U320 SCSI/2port
1000Base-T Adapter
                      /dev/mpt7
ext_bus 8 1/0/4/0/0 mpt CLAIMED INTERFACE HP AB290A PCI-X 2port U320 SCSI/2port
```

```
1000Base-T Adapter
                          /dev/mpt8
ext_bus 9 1/0/4/0/1 mpt  CLAIMED INTERFACE HP AB290A PCI-X 2port U320
SCSI/2port 1000Base-T Adapter
                          /dev/mpt9
```

In this example, two AB290A adapters are installed on the system. The fourth and fifth columns in the `ioscan` output indicate that the adapters have been claimed by the mpt driver. The third column shows the hardware path of the slot in which the card is installed. This path will be different for each installed card. The AB290A adapter supports two PCI devices or functions (one per channel). Two lines are listed for each AB290A adapter, —one for channel A (denoted by a `0` as the last digit in the hardware path), and one for channel B (denoted by a `1` as the last digit in the hardware path). The device file for each channel of each installed adapter is in the second line of the ioscan output, for example: `/dev/mpt6` or `/dev/mpt7`.

— For more detailed information on installed AB290A adapter(s), including the SCSI parameter settings as well as verification of devices that have been connected to the AB290A adapter(s), issue the **`mptconfig <dev file>`** command for each channel of each AB290A adapter. Use the device files displayed in the `ioscan -fnkd mpt` output.

For example:

```
# mptconfig /dev/mpt8
 Scan For Devices ...
---- ADAPTER INFORMATION -------------------------------------------------
 Device File                 : /dev/mpt8
 Hardware Path               : 1/0/4/0/0
---- BUS PARAMETERS -------------------------------------------------------
 Initiator SCSI ID           : 5
 SCSI Bus Rate               : Ultra320
 SCSI Bus Width              : Wide
---- CHANNEL CAPABILITIES -------------------------------------------------
 Req/Ack Offset              : 127
 Bus Mode                    : LVD
 Quick Arbitration Selection : Enabled
 DT Clocking                 : Enabled
 Packetized                  : Enabled
---- TARGET PARAMETERS ----------------------------------------------------
 Target Description     Firmware  In Use    In Use
 Id                     Version   Rate      Width
 -------------------------------------------------------------------------
 0     ST318453LC       HPC3      Ultra320  Wide
 2     ST373453LC       HPC3      Ultra320  Wide
 4     ST373453LC       HPC4      Ultra320  Wide
```

```
    ----------------------------------------------------------------------------
    #
```

NOTE	When the system boots after installation, the **insf** command creates the proper device files for the "ctl" interfaces (which would include the AB290A adapter) as well as the SCSI devices attached to the AB290A adapter. Sometimes, however, the insf command does not create all of the device files that are needed. For example, this happens when you attach SCSI disks to the adapter after the system boots, but the adapter is already installed in the system.
	If you see a SCSI device listed in the ioscan output, but there is no device file in the second line of the ioscan output for that device, the device file is missing. To solve this problem, issue the **insf -e** command, which will create *all* of the device files.

For more information about the ioscan command, see the ioscan(1M) man page.

For more information about the insf command, see the insf (1M) man page.

Refer to your system documentation for information about verifying system operation.

Step 10: Verify the LAN installation

- Verify that the LAN connector's Link LED is steadily on (this means the card and driver are installed successfully).

- Obtain the PPA number and the station address of each card by using the lanscan command.

- To verify link-level connectivity with a remote system, enter:

  $ **linkloop -i *PPA_number remote_station_address***

  Note: when you use linkloop, ensure that the remote system is on the same subnet and is an HP-UX-based system.

- To verify IP-level connectivity with a remote system, enter:

  $**ping *Remote_IP_Address***
  and
  netstat -in

  When you use netstat -in, the output values Ipkts and Opkts should be incrementing.

- Installation is complete when you have successfully run linkloop, ping, and netstat. To configure remote systems, see the *Ethernet Support Guide* available on the web at **http://docs.hp.com**. Do this step only if remote systems have not been previously configured.

- Optionally, if you want to verify that the iether driver appears for each installed card, enter: **ioscan -fknClan**

The ioscan output for each port would look something like the following:

```
Class I H/W Path Driver S/W State    H/W Type Description
lan   3 1/10/0/1   iether    CLAIMED  INTERFACE HPAB290A PCI-X 2port U320 SCSI/2port 1000Base-T
```

```
Adapter
```

The last two digits of the hardware path (third column) reflect the path of each port.

Optional Step: Configure Jumbo Frames Size (Jumbo frames are supported only at 1000 Mbit/s)

- Jumbo frames for the `iether` driver on HP-UX 11i v 1.0 and on11i v 2.0 of September 2004 (or later) have an mtu_size in the range from 1501 to 9000 bytes.
  If you are using Jumbo Ethernet frames, ensure that:

  — all end stations on a given **LAN**[1] have the same maximum transmission unit (MTU) setting;

  — intermediate stations such as switch ports in your LAN have an MTU equal to or greater than the end station's MTU.

- Obtain the PPA number of the card by entering `lanscan`.

- Choose one of two configuration methods that will permanently save your configuration.

  — use the GUI-based system admin manager (SAM).
  To use SAM, type **sam** at the HP-UX system prompt; then double-click Networking and Communications, and then Advanced Configuration--see *Ethernet Support Guide* for details, and then do the steps for verifying the MTU size;

  or

  edit the following configuration file using an editor such as "vi":
  /etc/rc.config.d/hpietherconf.
  Set the mtusize by editing HP_IETHER_MTU[0]=*mtusize*, and insert the proper interface name: HP_IETHER_MTU[i]=HP_IETHER_INTERFACE_NAME. When the system reboots, the interface will be configured for jumbo frame operation.

- Verify MTU change by entering **netstat -rn**. If MTU has not changed, enter the following commands:

```
$ifconfig lan PPA_number unplumb
$ifconfig lan PPA_number ip_address netmask netmask up
```

- To check (or verify) the current Ethernet frame size, enter:

```
$lanadmin -m PPA_number
```

An alternative way to temporarily configure jumbo frame size is to enter:
lanadmin -M *mtu_size* *PPA_number*.

Using `lanadmin` is temporary because it will not preserve your settings across reboots.

The **PPA_number** is the one we obtained from the output of lanscan. For using Jumbo Frames with the `iether` Gigabit Ethernet driver on HP-UX 11i v 1.0 or 11i v 2.0 of September 2004 (or later), set the mtu_size to a number from 1501 to 9000 (bytes).

For Further Information

For further information on the Gigabit Ethernet and SCSI as implemented in this card, please refer to **http://docs.hp.com** and then look under I/O Cards and Networking Software. This card's information is primarily located under the subsection called "Combination Cards."

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1. In the Jumbo Frames discussion, "LAN" means that the end stations do not have any routers or layer 3 switches in between them.

 Maintenance and troubleshooting information about the drivers used in this product can be found in various documents on: **http://docs.hp.com** under "I/O Cards and Networking Software."

The iether Gigabit Ethernet driver used in this product is located in the *Ethernet Support Guide*.

There is maintenance and troubleshooting information about the mpt SCSI driver used in this product in the *SCSI Support Guide*. The mpt driver is the same one used in the A7173A SCSI product and has the same features as the driver described in that product's documentation. For further details on advanced features, see the HP A7173A PCI-X Dual Channel Ultra320 SCSI Host Bus Adapter Support Guide.

There is also a *Support Matrix* for Gigabit Ethernet and a separate one for SCSI.

Network Configuration Worksheet

Fill out one worksheet for the networking data of each LAN port on the combination card you are installing.

Table 2 **Network Configuration Worksheet**

| Data Type	Required/ Optional	Default	How to Configure (see Note 1)	Example	Your System
Internet Address	Required	0.0.0.0	SAM or `ifconfig` or edit `/etc/rc.config.d/netconf`	196.6.20.2	
Subnet mask	Required if using subnetting	Subnet mask not used	SAM or `ifconfig` or edit `/etc/rc.config.d/netconf`	255.255.248.0	
Station address	Built-in but can be optionally changed	As shown on card	SAM or edit `/etc/rc.config.d/hpietherconf` or temporarily: `lanadmin -A`	0x0060b0c4012f	
Host name alias for this network interface (card)	Required if the system is connected to more than 1 network	None	SAM or edit /etc/hosts	host1	
Link configuration	Required	Autonegotiating	SAM or temporarily: `lanadmin -X`	`lanadmin -X auto_on ppa#` (if already turned off)	
Link speed/duplex mode	Required	Autonegotiating	Hub or switch (see Note 2) SAM or temporarily: `lanadmin -X`	`lanadmin -X 100fd ppa#`	
MTU (Maximum Transmission Unit): Jumbo Frames	Optional	1500 bytes	SAM or edit `/etc/rc.config.d/hpietherconf` or temporarily: `lanadmin -M`	`lanadmin -M 9000 ppa#` (see Note 3 below)	
Receive flow control	Optional	On	SAM or edit `/etc/rc.config.d/hpietherconf` or temporarily: `lanadmin -X`	`lanadmin -X fctrl off`	

Note 1: To configure values permanently, edit the configuration files using SAM or an editor such as "vi". Using lanadmin will not preserve your settings across reboots.

Note 2: The speed configuration of the card can be 10, 100, or 1000Mbps and is determined by the speed setting of the hub or switch port to which the card is connected. The card automatically senses this speed. The Base-T ports only run at one speed at a time. To verify the speed selection, run `lanadmin -x ppa#`.

Note 3: Following are the valid MTU sizes:

- For normal frames using the iether driver on HP-UX 11i v 1.0, the MTU size is a number from 257 to 1500 bytes. On HP-UX 11i v 2.0, the MTU size for normal frames is a number from 1024 to 1500 bytes.

- For jumbo frames using the iether driver on HP-UX 11i v 1.0 or HP-UX 11i v 2.0, the MTU size is a number from 1501 to 9000 bytes.

Figure 1   **AB290A PCI-X 2-Port U320 SCSI and 2-Port 1000Base-T Combination Card**
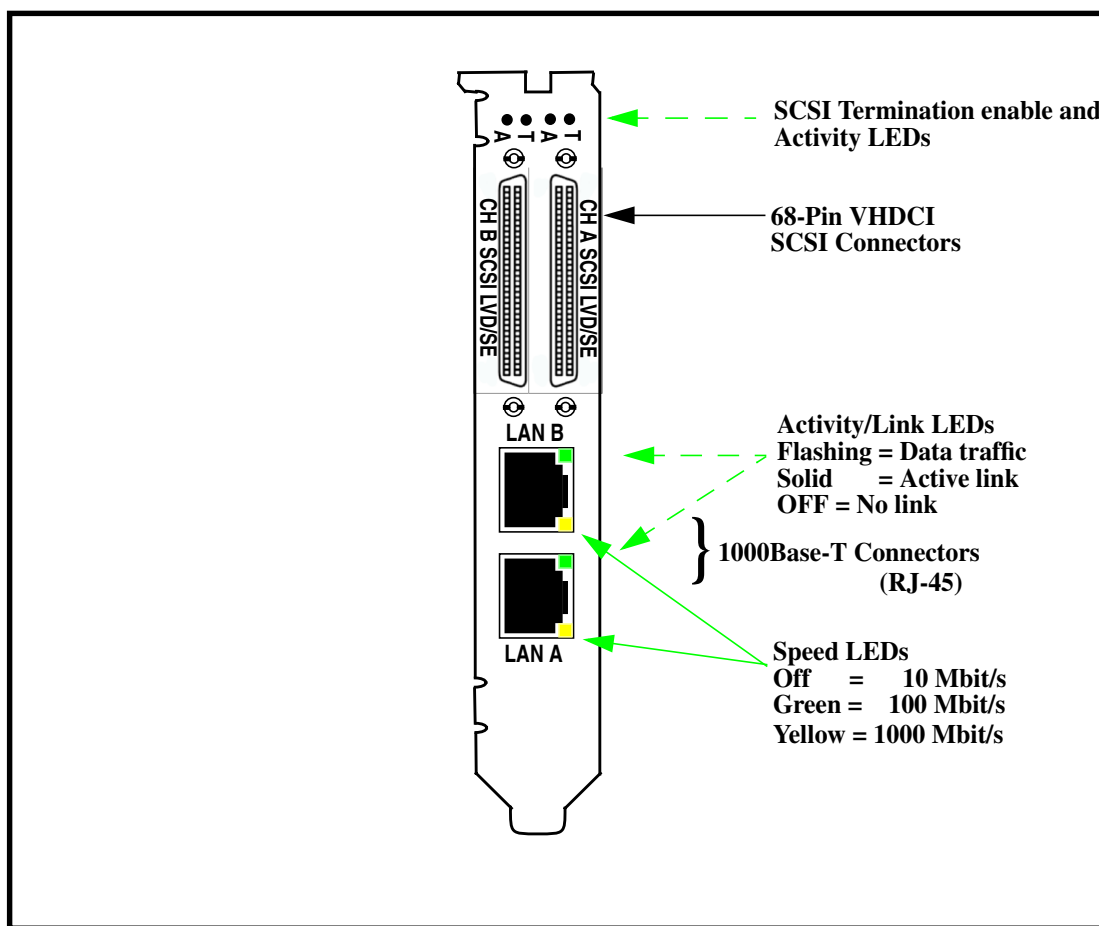
Product Overview and Requirements

The AB290A PCI-X Combination cards have the following features and requirements:

- **PCI-X 133 MHz** capable card. It can operate at 32-bit or 64-bit modes and is supported in the following frequencies: PCI 66, PCI-X 66, and PCI-X 133. Best performance is achieved by putting the card in a "**dual-rope**" PCI-X 133 slot. To identify which slots are the dual rope slots in a particular system, please refer to the hardware users' guide for each system. The AB290A card is *not* supported in PCI 33 bus mode. It operates in **3.3V slots only**.

- Requires either HP-UX 11i v 2.0 (64 bit) operating environment (OE) of **September 2004 (or later)** or the two software bundles, **IEther-00** (for LAN) and **scsiU320-00** (for SCSI), from the 11i v 1.0 of **December 2004 (or later)** software distribution.

  — For 11i v 2.0, your system needs to be on the September 2004 operating environment or later, so you need to load the entire OE.

  — For systems that are already running 11i v 1.0, you can either just load the required software driver bundles, or you can load the entire OE and you will automatically get the two drivers you need for this card.

- The Gigabit Ethernet ports support use of **Jumbo Frames**.

- Supports HP **Serviceguard** for the whole card and Auto-Port Aggregation (**APA**) for high availability of the 1000Base-T ports.

- The Gigabit Ethernet ports support virtual LANs (**VLANs**). This feature is described in *Using HP-UX VLANs* on **http://docs.hp.com**.

- Supports PCI-X online addition/replacement (**OLA/R**) on specified systems. For instructions on how to perform online addition and replacement (OLAR) for PA-RISC-based systems running HP-UX 11i v 1.0, see *Configuring HP-UX For Peripherals*. For instructions on performing OL* for Itanium-based systems and PA-RISC systems running HP-UX 11i v 2.0 of September 2004 or later, refer to the *Interface Card OL* Support Guide*.

- Supports configuration through **SAM** or command line.

- Online/Offline Diagnostics.

- Ignite UX support.

- Maximum data rate of 320 Mbytes/s over each SCSI channel.

- Supports boot over the 1000Base-T and SCSI interfaces.

- SCSI T10 Parallel Interface SPI-4 operates as two 16-bit wide, synchronous or asynchronous, low-voltage differential (LVD) or single ended (SE) interfaces.

- Supports vPars.

- The AB290A does not support any configuration where it is in the middle of the SCSI bus (using "Y" cables or simultaneous internal and external connections.

- SCSI termination is enabled by default. HP only supports configurations where the termination is enabled.
  The termination Disabled LED will glow when termination is disabled (basically during unsupported configurations)-- for example, when the terminators on that bus have been disabled. The channel A termination disable LED will only glow if the jumper is installed across both posts. The channel B termination disable LED will glow if the jumper is installed or if cables are connected to both the internal and external channel B connectors (this is not a supported configuration).

Interoperability: Supported Systems

Supported Systems

The combination card is supported in the HP Integrity (Itanium® or Itanium®2-based) systems specified in Table 3.

Table 3   Combination Card in HP Integrity Systems

rx1600 and rx1620
rx2600
rx2620
rx4640
rx7620
HP Integrity Superdome IA 16-way, 32-way, 64-way,128-way, and 192-way
rx8620 and rx8620 with Server Expansion unit

The combination card is supported in the HP 9000 (PA-RISC processor-based) systems specified in Table 4.

Table 4   Combination Card in HP 9000 Systems[a]

rp3410-2
rp3440-4
rp4440-8
rp7420-16
HP 9000 Superdome (in 3.3 volt slots; PA8800 or later processors) PA 16-way, 32-way, 64-way, 128-way, and 192-way
rp8420-32 and rp8420 with Server Expansion unit

a. The AB290A combination card is *not* supported on rp7410, rp8400, or on HP 9000 Superdomes that have 8600 or 8700 processors.

Card Physical and Environmental Specs and Regulatory Information

Card Physical and Environmental Specifications

Following are the product physical and environmental specifications of the AB290A PCI-X 2-Port U320 SCSI and 2-Port Gigabit Ethernet Combination Card.

Physical Specifications

Form Factor	PCI-X (2.3)
PCI support	64-bit 3.3V only 133Mhz
Height	10.8 cm (4.25 in)
Depth	21.6 cm (8.5 in)
Width	2 cm (0.7 in)
Weight	0.18 kg (0.4 lb) kg

Electrical

Power consumption:	25 Watts

Environmental

Temperature
Degrees F = (1.8 x Degrees C) + 32

Operating Temperature Range (Degrees Celsius)	+5º C to 40º C
Recommended Operating Temperature Range (Degrees Celsius)	+10º C to 40º C
Non-operating/ storage Temperature Range (Degrees Celsius)	-40º C to 70º C
Temperature Shock Immunity - Max Rate of Change	20 C/hr
Non-operating/storage Humidity Range in %RH	90
Recommended Operating Humidity Range @ 22 Degrees Celsius in %RH	40 to 60
Heat Dissipation (in Watts)	17
Maximum kV (if less than 15 kV) with no loss of function	8
Maximum kV (if less than 25 kV) with no component damage	25
Operating Altitude	3,000 meters (9900) ft
Non-operating Altitude	4,500 meters (14850 ft)

Electromagnetic Compatibility

This document contains regulatory statements for the United States and the European community.

FCC Statement (For U.S.A.)

Federal Communications Commission Radio Frequency Interference Statement

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WARNING **This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:**
(1) This device may not cause harmful interference and
(2) this device must accept any interference received, including interference that might cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Hewlett-Packard's system certification tests were conducted with HP-supported peripheral devices and cables, such as those received with your system. Changes or modifications to this equipment not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment.

Canada

Warning: This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.
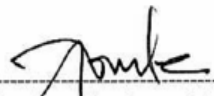
Cet appareil numérique de la classe A respecte toutes les exigences du règlement sur le matériel brouilleur du Canada.

EMI Statement (European Community)

NOTE This is a Class A product. In a domestic environment, this product may cause radio interference, in which case you may be required to take adequate measures.

DECLARATION OF CONFORMITY
According to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Hewlett-Packard Company
Systems Interconnect Solutions Lab

Manufacturer's Address: 8000 Foothills Blvd.
Roseville, CA 95747
USA

declares, that the product

Product Name: HP PCI-X 2port U320 SCSI / 2port 1000B-T HBA

Model Number(s): AB290A

Product Options: All

conforms to the following Product Specifications:

Safety: EN 60950:1999 Third Edition

EMC: CISPR 22:1997 / EN 55022:1998 - Class A
CNS 13438, GB 9254-1988, CFR47, Part 15 Class A
CISPR 24:1997 / EN 55024:1998
IEC 61000-4-2
IEC 61000-4-3 / ENV 50204
IEC 61000-4-4
IEC 61000-4-6

Supplementary Information:

The product herewith complies with the requirements of the EMC Directive 89/336/EEC and carries the CE marking accordingly.

1) The Product was tested in a typical configuration with Hewlett-Packard information technology equipment.

Tom Le, Hardware Engineer

Cupertino, CA, March, 2005

European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department HQ-TRE, Herrenberger Straße 130, D-71034 Böblingen (FAX: + 49-7031-14-3143)